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ABSTRACT

This study was conducted with three purposes in mind: (1) to determine the utility of the Colwell Music Achievement Test 3 (MAT3) as an instrument for measuring student instrumental music achievement; (2) to determine the types of musical achievement exhibited by students in Tennessee's secondary music programs; and (3) to determine the utility of the notion of an instrumental music student's being musically independent. The concept of "musical independence" was conceived to provide a framework for studying student achievement or improvement. Musical independence implies the mastery of five specific musical skills: (1) think; (2) listen; (3) perform; (4) conduct; and (5) compose. The study compared outstanding secondary instrumental music programs in Tennessee (as nominated by post-secondary instrumental directors) with a group of randomly selected programs, based on student performance on the MAT3. Among the study findings were that the MAT3 can be used to differentiate between students and programs that contribute to musical independence and students and programs that do not. A reference list is included as well as a list of musical achievement tests referenced in the text. (DB)

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Evaluating Student Achievement in Secondary Instrumental Music Programs

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Evaluating Student Achievement in Secondary Instrumental Music Programs

. . . [Tennessee] shall develop comparable and appropriate certification and evaluation ***standards, criteria, procedures, and instruments*** *. . . for the evaluation and advancement of such teachers. The State Board of Education shall develop, and provide to local education agencies,* ***guidelines and criteria*** *for the* ***evaluation*** *of all certificated persons employed by such agency (emphasis added).*[1]

Evaluating music teachers in accordance with the Tennessee Code Annotated regulation printed above poses special problems. Music programs are not easily evaluated in the usual manner. Classroom observation is one usual evaluation tool, of course, but music teachers' real evaluations are often based on pupil performance, such as marching contests, solo-ensemble, all-state band, concert festival, or classroom performance. If teacher evaluations are based on pupil gain, there are standardized tests to measure student cognitive gain (e.g., the California Achievement Test or CAT). There is no generally accepted and used music achievement test and gain in music is not just cognitive. Further, music educators have different opinions concerning what knowledge and skills are associated with musical independence.

With these facts in mind, Bobbett[2] conducted a study for the following purposes:

1. to determine the utility of the Colwell Music Achievement Test 3 (MAT 3)[3] as an instrument for measuring student instrumental music achievement, and

2. to determine the types of musical achievement exhibited by students in Tennessee's secondary music programs.

In seeking to review the first two concerns, Bobbett needed to specify criteria for improvement, goals for music education and a framework for studying student achievement or improvement. These considerations led to a basic purpose of the study

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1 Tennessee Code Annotated (TCA): Title 49, Sec. 3-10

2 Bobbett, G.C., (1987). Identifying Music Achievement for Students Participating in Outstanding Programs. Doctoral Dissertation. Knoxville, TN: The University to Tennessee.

3 Colwell, R. (1970). Administrative and Scoring Manual, Music Achievement Test 3. Chicago: Follett Educational Corporation.

on which the other purposes rested:

3. to determine the utility of the notion of an instrumental music student's being musically independent.

To move toward resolution of the first two purposes, some understanding of musical independence is necessary. The next section presents a theoretic base for the concept, musical independence.

Musical independence

Musical independence, although only tacitly recognized by most contemporary music educators, is a fundamental measure of musicianship. It is the one descriptive phrase that incorporates all musical skills under one umbrella. Although music skills associated with musical independence are not universally defined in identifiable and measurable terms, the holistic nature of musical independence encompasses all acquired music skills.

Musical independence implies the mastery of specific musical skills. The five hierarchical skill levels for musical independence are: (1) Think, (2) Listen, (3) Perform, (4) Conduct, and (5) Compose. They range, respectively, from the basic skills to the most advanced skills. These skills are in a structured hierarchy; a prerequisite for obtaining a higher skill level is the mastery of successive lower-level skills. The range of each skill covers a broad spectrum of simple to complex competencies. The breadth of each skill, therefore, is directly related to the breadth of the successive lower-level skills. The definitions for the five skill levels are:

1. Think: the ability to identify cognitively music's attributes.
2. Listen: the ability to sense (discriminate, interpret, and evaluate) sounds.
3. Perform: the ability to make (instrumentally/vocally) music.
4. Conduct: the ability to direct (plan, coordinate, and assess) performers.
5. Compose: the ability to create original music.

The above definitions, admittedly, are grossly simplified. A model (see Figure 1)

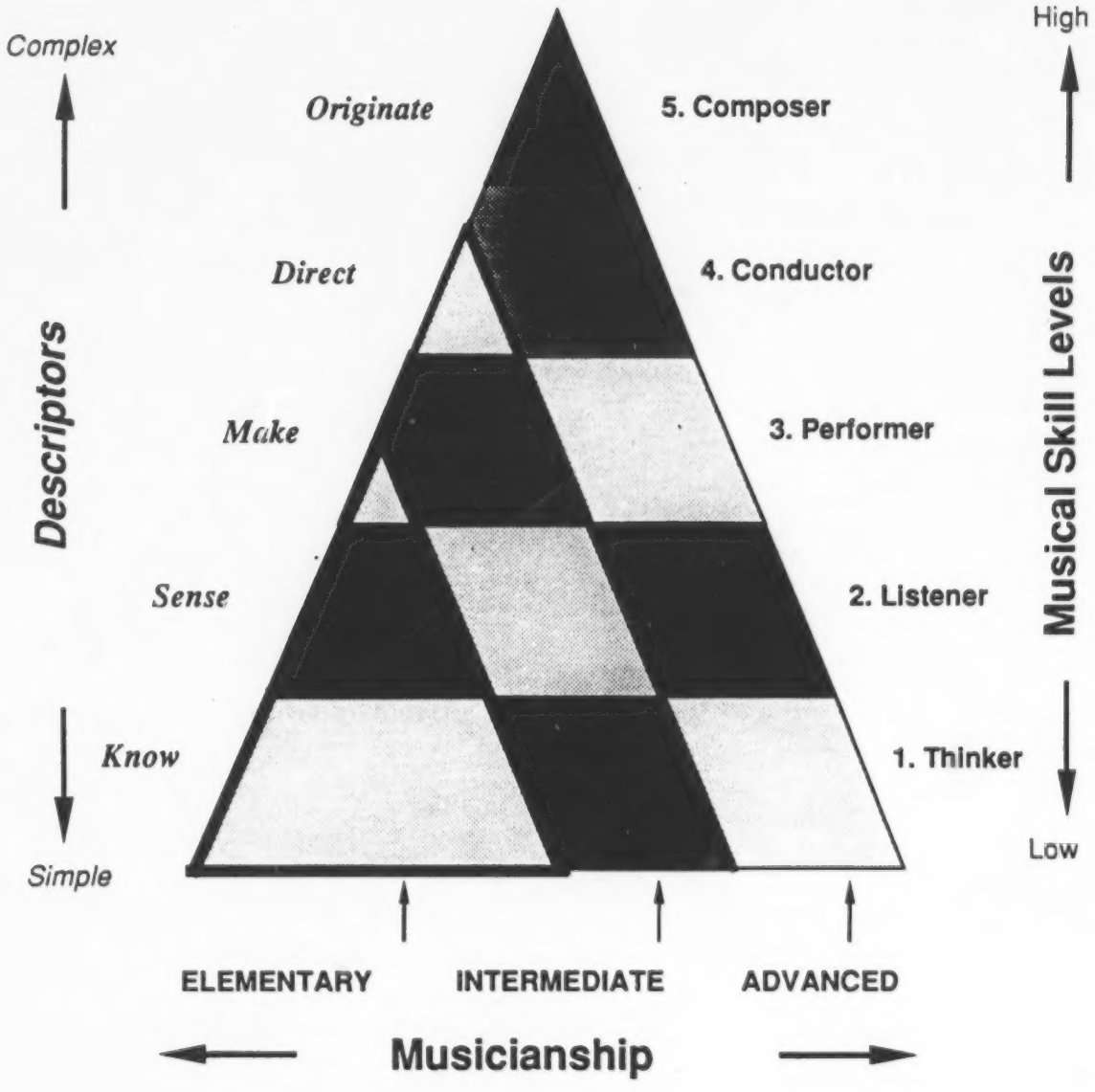

Figure 1. Musical Independence Hierarchy

for musical independence will illustrate that **musicianship** (horizontal axis) ranges from a typical high school instrumental student (beginner) to a concertizing professional (advanced). Consequently, each definition incorporates the full spectrum of musicianship. During the musicianship maturing process (elementary to advanced) the model indicates that the student also incorporates additional **skill levels** (right--vertical axis). The musical independent **descriptors** (left--vertical axis) illustrate the musically independent musician's cognitive/psyco-motor development. In applying the musical independence descriptors; knowing is a prerequisite to sensing; sensing is a prerequisite to doing; making is a prerequisite to directing; and directing is a prerequisite to creating.

This model, therefore, illustrates that the student's musical independence growth is directly related to two factors: (1) the addition of new musical skill levels, and (2) the musical skill level's respective breadth. Logically, since "outstanding" instrumental students reflect superior performance skills, the model indicates that they also have superior auditory-perception skills. Similarly, when conductors are assessed, their performance skills become an acceptable musical independence indicator. Figure 1 presents the author's working model of musical independence.

For a comprehensive understanding of musical independence and for the future assessment of secondary instrumental students' levels of musical independence, the musical independence idea is illustrated by two areas: (1) American music achievement tests, and (2) publications, symposia, and conferences.

American Music Achievement Tests

Music achievement tests, one authoritative source in defining and assessing the parameters of musical independence, contribute to the assessment of musical independence because they: (1) identify specific musical skills, and (2) contribute to the methodology of assessing these skills. For organizational purposes, the test's are divided into early (1920-1950) and contemporary (1950-present) music achievement tests.

A. Early Musical Achievement Tests (1920 - 1950)

Authors of early musical achievement tests primarily assessed cognitive skills. Cognitive skills most commonly identified and evaluated during this period were time values, symbols, terms, pitch names, familiar melodies, and key signatures. These authors (Kwalwasser-Ruch, Gildersleeve, Kelsey, and Kotick-Torgerson) had conflicting opinions concerning which music skills should be tested and the comparative importance of the specific skill. While some authors used a few items (3 to 4 items) to evaluate a specific music skill, others devoted an entire subtest (10 to 15 items) to the task. A second group of authors (Beach, Mosher, Knuth, and Strouse) divided their tests into two general categories: cognitive and auditory-perception skills. The third group, represented by Aliferis and Aliferis-Strecklein, measured auditory-perception skills exclusively.

Three summary generalizations reflect this 30-year period: (1) no one music achievement skill or group of skills was universally identified and incorporated in all achievement tests, (2) there was no universally accepted method (cognitive v. auditory-perception) of assessing skills, and (3) generally, the test items evaluated fundamental rather that a complex music skills.

B. Contemporary Musical Achievement Tests (1950-present)

The contemporary music achievement test authors (e.g., Aliferis, Knuth, Gordon, and Colwell) almost unanimously believed that the design of a music achievement test should assess the individual's auditory-perception skills. The one exception, Watkins-Farnum Performance Scale, evaluates performance skills. The contemporary music achievement authors assess many of the same skills identified by the early authors, but because of the increased complexity of "musical independence" as one proceeds up the hierarchy, they had greater flexibility in evaluating music skills. Their subtest descriptors ranged over a broad spectrum which included: melodic elements, harmonic elements, recognition of notation for pitches and rhythms, direction of music, tonal;

aural-reading-notation (major/minor), meter discrimination, major-minor mode discrimination, feeling for tonal center, musical style, chord recognition, and cadence recognition.

The above music skill descriptors have one flaw: without knowing the specific music achievement subtest, a knowledgeable music educator would have difficulty in knowing which specific music skills were being assessed. Therefore, without exception, a schooled musician, using any one descriptor, could design many slightly different subtests that would qualify for the respective descriptor, although music independence is tacitly implied through the collective content of these tests.

The researcher noted that the musical achievement test literature is void of any achievement test that implies a connection between the student's musical independence and musical achievement skills.

Publications, Symposia, and Conferences

The music education publications, symposia, and conferences recognize musical independence as one principle outcome of music education. Lubuta refers to the notion of "musical independence":

> . . . the term musicianship is often used when referring to comprehensive musical attributes and abilities of performers. It is theory applied to practice; it is knowledge and skill applied to practical music making (p.7, 1972)[4] (emphasis added).

Hoffer selects different terminology, but implies essentially the same idea by stating:

> On a level commensurate with his maturity and musical development, a high school musician should be aware of what is happening in the music from the standpoint of both aesthetic understanding and effective performance (emphasis added)[5].

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4 Labuta, J.A. (1972). Teaching Musicianship in the High School. West Nyack: Parker Publishing Company.

5 Hoffer, C.R. Introduction to Music Education. (1983). Belmont: Wadsworth Publishing Co., p.255.

The Contemporary Music Project (CMP) for Creativity in Music reported: ". . . the pattern on music learning is the same at all states of instruction, and that the process of differentiating significant structural relationships is fundamental to all levels" (emphasis added).[6] The CMP references many of the hierarchy's levels:

> As a consequence of effective analytical training, the musician should demonstrate the following skills:
>
> 1. As performer, he should be aware of the interrelationships within a musical work, in order to be able to project the whole of the work to his listeners as a series of interrelated parts.
> 2. As composer, his craft will be enhanced by an understanding of how music has been organized in the past,
> 3. As listener, he should be able to organize and comprehend what he hears, through which a comprehensive musical experience may be gained (emphasis added).[7]

As a summary of education goals of a music instructor, Abeles, Hoffer and Klotman write: "Regardless of the music class, students should be able to learn the following: . . . (3) Intellectual understandings. . . , (4) . . . skills in performance. . ., (5) . . . skills in listening. . .(emphasis added)."[8]

In summary, the contemporary music achievement tests plus the recent publications, symposia, and conferences unanimously identified specific music achievement skills. In addition, the test methodology should assess the student's auditory-perception skills.

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6 Benson, W. (1967). "Contemporary Music Project for Creativity in Music Education." Washington: Music Educators National Conference, p.14.

7 Ibid., p. 16.

8 Abeles, H.F., Hoffer,C.R., and Klotman, R.H. (1984). Foundation of Music Education. New York: Schirmer Books, A Division of Macmillan, Inc., pp. 274-275.

Colwell's Music Achievement Test 3

A major task in the study was the selection of the music achievement test that would serve as the criterion measure. The researcher used the following standards in selecting a music achievement test: (1) a large population for the test standardization, (2) ease of administration and scoring, (3) wide recognition by both contemporary publications and symposia, (4) ease of test assessing, and (5) ease of administration in one typical class meeting. After identifying and reviewing 20 American music achievement tests and 4 foreign tests, the researcher selected The Colwell Music Achievement Test 3 (MAT 3) because it seemed to meet the established and necessary criteria for fair teacher appraisal.

To assist in the final selection of a single music achievement test, the researcher focused the literature review on the notion of musical independence and listening skills associated with musical independence--in other words, identification of the commonly recognized music achievement skills associated with the notion of musical independence. From the musical achievement test literature review, the writer noted that many leading music educators recognize and endorse Colwell's MAT 3. Furthermore, these MAT 3 skills are congruent to the cited music achievement skills in the notion of musical independence.

Major symposia and conferences such as the "Contemporary Music Project for Creativity in Music Education" and "Symposia in Music Education"[9] directly or indirectly referenced many of the musical achievement skills identified in the MAT 3.

Many music education authors recognize the musical achievement skills identified by Colwell's MAT 3.

Whybrew writes:

> Colwell's has made a very interesting contribution to the literature of music test, and it is to be hoped that research studies and use of the battery will provide more information about its advantageous utilization.[10]

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9 Symposia in Music Education. (1982). Urbana-Champaign: Crouse Printing, .

10 Whybrew, W.E. Measurement and Evaluation in Music. (1971).(2nd. ed.)Dubuque: WM. C. Brown, p. 170.

Bessom, Tatarunis and Forcucci write:

> . . . the test seems to have a considerable degree of relevance to current music-education philosophy, objectives, and practice. The battery is easy to administer and to take because all directions are given on the test recording (emphasis added).[11]

Charles R. Hoffer wrote, in the Introduction to Music Education:

> The most notable published achievement tests are the Music Achievement Test by Richard Colwell and the Achievement Tests in Music by William Knuth.[12]
>
> Knuth's Achievement Test in Music is neither as comprehensive nor as well standardized as Colwell's.[13]
>
> The norms were developed from a sample of 9,600 students, a far greater number than was used in standardizing any other music test (emphasis added).[14]

Collectively, the literature review indicated that many contemporary music educators and authors acknowledged, although sometimes indirectly, that: (1) the notion of musical independence is a valid and justifiable education outcome, (2) the most appropriate technique of measuring these music skills should incorporate the testing of the student's auditory perception , and (3) the skills identified in Colwell's MAT 3 were identical to the skills mentioned directly or indirectly by many leading music educators.

Colwell's MAT 3 is an auditory-perception music achievement test that takes approximately 35 minutes to administer. It is divided into four sub-sections or parts: (1) Tonal Memory, (2) Melody Recognition, (3) Pitch Recognition, and (4) Instrument Recognition. The answer sheets, the Administrative and Scoring Manual, Interpretive Manual, and a 12-inch record are provided for the administration of the MAT 3. The

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11 Bessom, M.E., Tatarunis, A.M. and Forcucci, S.L. (1980). Teaching Music in Today's Secondary schools: A Creative Approach to Contemporary Music Education. New York: Holt, Rinehart and Winston, p. 320.

12 Hoffer,p.212.

13 Hoffer,p.213.

14 Hoffer,p.212.

Administrative and Score Manual furnishes complete test directions plus an abbreviated table of norms, and the Interpretive Manual furnishes a complete explanation of test development, directions for scoring, plus comprehensive tables of test reliability. The MAT 3 Interpretive Manual also supplies the following data: (1) test standardization, (2) mean, standard deviation, reliability, range, and median, (3) item analysis, (4) intercorrelation by grade, and (5) norm tables. The Administrative and Scoring Manual and the recording both provide test directions.

Questions

The following questions were formulated to address the three-fold purposes of this study:

1. Will the MAT 3 differentiate between outstanding programs (nominated) and average (selected) programs?
2. Will students in nominated and selected programs differ on the four areas of MAT 3--Tonal Mastery [ST1], Melody Recognition [ST 2], Pitch Recognition [ST 3], and Instrument Recognition [ST 4]?
3. Of the MAT 3's four subtest results from the nominated programs, which ones most positively correlate with the post-secondary school instrumental director's (PSSID) rankings?
4. Of the identifiable and measurable learner musical outcomes, what degrees of mastery of musical knowledge do students exhibit in the nominated and randomly selected instrumental programs?
5. What conclusions about musical achievement can be drawn from the MAT 3 test results of both the nominated and selected instrumental programs?
6. Is there a group test in music which will be of value to educational administrators in evaluating secondary school instrumental teachers?

To test the utility of Colwell's MAT, the researcher identified two groups of instrumental music programs. One group included schools with outstanding secondary instrumental programs. The other group, which served as the control group, was randomly selected from remaining schools with instrumental music programs.

Identifying Tennessee's Outstanding Secondary Instrumental Music Programs

To identify the outstanding instrumental music programs, the researcher surveyed Tennessee's Post-Secondary School Instrumental Directors, or PSSIDs. The PSSIDs (**conductors**) were considered experts because they had first-hand knowledge--through their exposure to secondary music students after these students had enrolled in post-secondary programs--of Tennessee's secondary instrumental students and programs. Thus, the PSSIDs identified outstanding secondary instrumental programs based on their judgments of the musical independence of students enrolled in their respective programs.

A master list of Tennessee's post-secondary schools served as the basis for the PSSID population. Of Tennessee's 78 post-secondary schools, 16 were eliminated because the schools' titles indicated that they would not have band programs (i.e., technological institutes, business colleges, etc.), while 32 other institutions were eliminated during the researcher's phone survey because they did not have instrumental programs. Thirty PSSIDs were contacted, and 24, in schools with an average student enrollment of 5,229 students, responded to the survey; 6 PSSIDs in schools with an average student enrollment of 1,694 did not respond. Of the 24 initial respondents, 20 continued to participate through completion of the project.

The 20 PSSIDs nominated and ranked up to a maximum of 10 outstanding secondary instrumental music programs, using the criterion that students from outstanding secondary programs would be musically independent (i.e., **performing** skills, **auditory-perceptual** skills, and **cognitive** skills). The PSSID's nominated 60 separate secondary school instrumental programs. The researcher then compiled a master list and selected the 10 secondary instrumental programs with the most nominations and highest rankings. This group became the nominated sample called the outstanding programs.

Selecting a Comparison Group

In selecting a population for comparison purposes, the researcher compiled a list of all Tennessee secondary schools. Of the 353 secondary schools, 60 schools were eliminated because they had been nominated by the PSSIDs. The researcher eliminated 59 because their names indicated that they would probably not have instrumental programs in the usual sense (i.e., vocational centers, the school for the deaf, etc.). The remaining 234 secondary schools became the population. Thirty secondary schools were randomly selected and contacted either by letter or phone. Of these 30, 5 did not have instrumental programs, 11 agreed to participate, and 7 participated to the end of the study. Thus, the random sample included seven schools and their music programs and music students. The outstanding programs (as nominated by the PSSIDs) and the randomly selected programs were then compared.

Nominated and Randomly Selected Students

A total of 655 students from grades 10-12 participated in the study: 528 students from 10 nominated programs and 127 students from the 7 selected programs. After the MAT 3 answer sheets were graded, analyses of both total scores and subtest scores were made for students and programs in both nominated and selected groups.

The researcher used the t-test for independent samples to analyze both the student responses and the student results by programs. The Spearman Rank-Order Correlation (rho) was used to assess the relationship between the PSSIDs' nominations and each of the MAT 3 four subtests

Findings

The findings for the study are:

1. The nominated secondary instrumental students, using Colwell's MAT 3, scored significantly higher ($p<.05$) than the randomly selected students from

four perspectives: (a) students' grand total scores; (b) students' total subtest scores on all four subtests; (c) programs' grand total subtest scores on all four subtests; and (d) programs' grand total scores. Although individual students in nominated programs consistently performed better (as measured by the MAT 3) than students in the randomly selected programs, the important finding is that the collectivity of students--programs--from the nominated schools scored higher on the MAT 3 than did the programs from the randomly selected schools. These results appear graphically in Figure 2.

2. Colwell's MAT 3, a group test in music achievement, can assist educational administrators in evaluating secondary school instrumental teachers because: (a) it is recognized by many of the leading contemporary music educators as an excellent music achievement test; (b) its directions, answer sheets, grading templates, test standardization information, and album are adequate for a secondary instrumental director or administrator to administer fairly easily, and (c) it meets the criterion of being of "value to Tennessee educational administrators" since it differentiated high-quality programs from "other" programs, and this differentiation is substantiated by a jury or panel of experts, (i.e., the PSSIDs) who chose the same schools as "outstanding."

The non-parametric Spearman Rank-Order Correlation (see Figure 3.) determined the relationship between the post-secondary school's size and the PSSIDs ability to identify "outstanding" secondary instrumental programs. The correlation coefficient of .976 indicated that the school's size was positively related to the PSSIDs identification of the outstanding secondary instrumental programs in Tennessee (n=8, p=967, Z=2.583, p<.05).

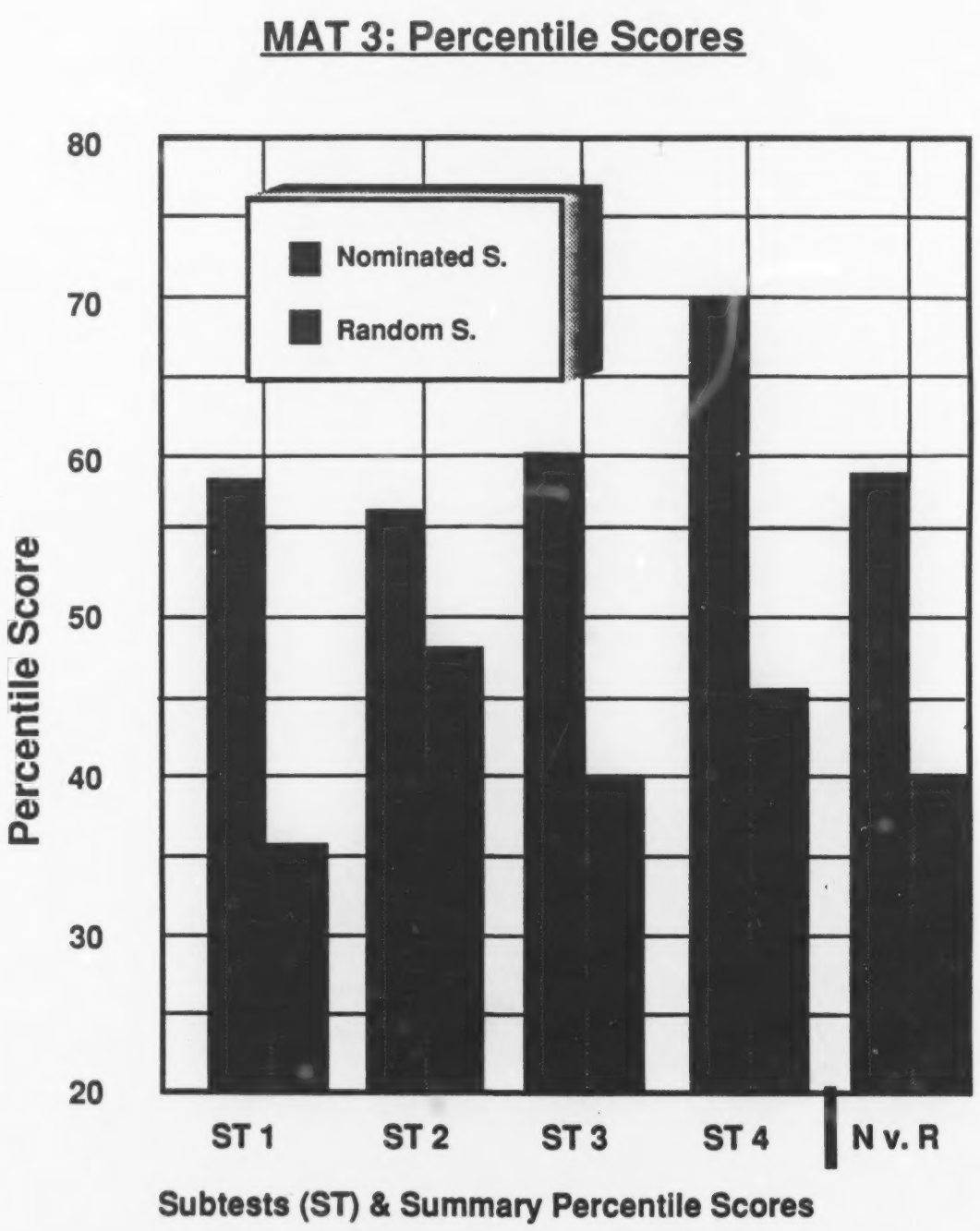

Figure 2. MAT 3: Percentile scores for subtests 1-4 and total score, Random and Nominated samples

Spearman Corr. Coef. X_1: Enrollment Y_1: Congruent Nominations

N	8
ΣD^2	2
Rho	.976
Z	2.583
Rho corrected for ties	.976
Z corrected for ties	2.582
#X tied groups: 0	#Y tied groups: 1

Figure 3. The Spearman Correlation Coefficient between the student enrollment size of the director's post-secondary school and its congruence with the directors to identify Tennessee's "outstanding" secondary instrumental programs.

Conclusions

1. The MAT 3 can be used to differentiate between students and programs that contribute to musical independence and students and programs that do not.

Using the parametric t-test for independent samples, the nominated secondary instrumental programs' grand total test mean scores (49.12) and the subtest scores (14.73, 11.30, 11.49, and 11.60) were significantly greater ($p<.05$) than the randomly selected programs total mean scores (43.03) and the subtest scores (13.45, 10.56, 9.60, 9.47).

2. The larger secondary instrumental programs appear to be better instrumental programs for developing musical independence in students than are the smaller programs.

The researcher observed that the average student enrollment (i.e., 111.8 students per program) of the typical nominated secondary instrumental program was more than twice as large as the randomly selected program (42.3) for grades 9-12.

3. PSSIDs can Identify Outstanding Secondary School Instrumental Programs.

The randomly selected programs' mean score of 39 was significantly lower than the nominated secondary school instrumental programs' mean percentile score of 62.

4. Musical independence, as perceived by Tennessee's PSSIDs, appears to be a holistic concept rather than a single musical skill.

None of the four MAT 3 subtest results has a particularly high, positive correlation with the nominated programs' ranking; thus, the MAT 3 seems to measure the general "musical independence" of the nominated and randomly selected secondary instrumental programs. Since there were only modest positive correlations between rankings and any one specific music achievement area, the PSSIDs were apparently nominating secondary programs from a holistic perspective. Since quality [in the study] is recognized holistically, neither the early music achievement tests that measure a single dimension of music skills (i.e., cognitive only) nor a single music achievement skill (i.e., any of the four MAT 3 subtests, etc.) is appropriate to differentiate programs in the broad area of quality.

5. Involvement and willingness to become involved in additional educational activities reflect superior leadership characteristics.

This conclusion is made from two observations: (1) 100 percent of the directors from the nominated secondary school instrumental programs volunteered to participate in the study, while only 7 of the 25 randomly selected directors volunteered to participate, and (2) the PSSIDs representing institutions with large student enrollments (n=20, μ=5,571) participated, but the PSSIDs representing institutions with smaller student enrollments (n=6, μ=1,694) did not participate. Since the directors from better and larger post-secondary instrumental programs participated in the survey, their involvement and willingness to become involved in additional educational activities seem to reflect their superior leadership characteristics. If this conclusion is valid, then superior leaders seem to be able to recognize the quality programs and students in these programs.

In Summary

Based on the study's findings and conclusions, the researcher believes that the concept of musical independence as derived here provides a basis to help in

evaluating music programs. The Colwell MAT 3 is useful in measuring student music achievement for many reason. Students in those Tennessee secondary programs nominated by the PSSIDs scored significantly higher than the students from the randomly selected programs on all four MAT 3 subtests, indicating a holistically superior level of music independence as defined in this study.

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